AMERICAN FARMER.

RURAL ECONOMY, INTERNAL IMPROVEMENTS, PRICES CURRENT.

" *O fortunatos nimium sua si bona norint*
" *Agricolas.*" . . . VIRG.

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AGRICULTURE.

FROM DUHAMEL'S ELEMENTS OF AGRICULTURE.

Observations on other Distempers of Corn.

After having treated at large what regards the chief distemper of grain, that is, what makes it black, we shall next notice the other distempers; viz. such as make it mildewed, barren or empty-eared, parched and shrivelled, glazed, abortive and rickety; and also mention laid-corn.

ART. I.—*Of mildewed or rusty corn.*

The Mildew is a distemper which attacks the leaves and stems of Wheat. It shows itself by a substance of the colour of rusty iron; it covers the leaves and stems of Wheat, when in its greatest vigour. This substance does not adhere strongly to the leaves; for I have seen white spaniels with their coat covered with a red dust, after hunting in a field of Wheat infected with this distemper. It is also well known that a heavy shower of rain will wash this rust or mildew off the Wheat, and it will be but little injured. The colour of the leaves have, doubtless, induced some Farmers to distinguish this distemper by the name of Rust. It is also probable, but I mention it only as a conjecture, that this is what the ancients knew under the name of *Rubigo*.

The cause of this distemper is commonly attributed to dry fogs coming when the Wheat is in the height of its growth: and indeed I have several times remarked, that when a hot sun-shine has succeeded these dry fogs, in a few days the Wheats were mildewed.

In very hot dry summers this distemper is much seen; but when the spring is wet, the finest Wheats are in danger of being spoilt by the mildew, which commonly shows itself when, during several dry days, no dew falls, and when in the morning after a dry fog the sun shines hot; the dust then grows so thick on the leaves as to be scattered on other plants at the distance of two feet. M. de Chateauvieux found that cutting off the rusty leaves was of service; the same plants put forth other leaves, and succeeded much better than what were not cut. When corn is mildewed, it may be mowed, but this must be when it is very young.

This is a dreadful distemper. The finest Wheats are suddenly reduced almost to nothing when the plants are very much affected.

If this distemper attacks Wheat when it is very young, and before it has pushed forth its stem, the damage is not great. provided, however, that a kindly season follows. In this case the plants are weakened as if the corn had been mowed or fed; they make fresh shoots and bear ears; yet the straw is shorter and the ears are less. But when the mildew, at the same time, attacks the leaves and the stem, the growth of the plant is stopped, insomuch that there ensues an immense loss in the crop, which is much diminished.

This dreadful distemper is well deserving of all the attention of Naturalists who are lovers of Agriculture; and I cannot sufficiently urge them to search into its causes and remedies.

Several writers have injudiciously confounded the Mildew, or Rust, with other distempers of grain.—M. Tillet attributes it the acrimony of fogs, which wound the texture of the leaves and stems, and occasion an extravasation of a fat and oleagenous juice, which, drying by degrees, is converted into a kind of orange tawney-coloured dust. On examining plants of Wheat, the leaves and stems of which are mildewed, with a powerful magnifying-glass, one may distinctly see little cracks in the spots where the red dust is, and that the epidermis, or outward thin skin of the plant is here and there wounded: this juice dried to a reddish dust seems to have come out of these little openings, over which little fragments of the epidermis may be seen, which perfectly cover these small apertures.

Be this as it may, the mildew of corn is the consequence of a distemper, the cause of which is not yet perfectly known. It is an erroneous opinion to imagine that the rust and farinaceous dust that is seen on several plants, is a mass of eggs that insects have deposited there, destined to produce a numerous family very destructive to vegetables. If we esteem the estravasation of the nutritive juices, the cause of these distempers it will appear that the mildew, the honey-dew, the farinaceous dew, and that unctuous matter which is seen on gramineous plants, partake of the quality of the juice concentrated in the plants, on which it shows itself by evaporation, and is converted sometimes into an impalpable powder, and, at other times, into that thick substance which is seen of a red colour on Garden-beans, reddish only on gramineous plants, greenish on the Plum-tree, yellowish on the Ash, white on the Larch-tree, &c.

These observations and reflections leave, doubtless, many things undecided; it is however certain, that they will put a careful observer into a proper train, and should excite Naturalists to exert themselves in a point of such publick utility. We shall not dissemble our having tried to produce the same effects as the dry fogs which cause the mildew, by applying to the leaves of several plants acid and corrosive liquids, and often glutinous juices capable of stopping the transpiration, without injuring the texture of plants. But, notwithstanding all our endeavours, we could perceive nothing that resembled mildew: but who can tell how far the sagacity of Naturalists may go? Some small circumstance might have escaped our observation, which perhaps hindered us from perceiving an object to which we had nearly approached. The good of the public induces us to wish that Naturalists would closely apply themselves to the discovery of a matter which may in their hands turn out of such universal utility.

M. Ginanni, in a paper published in the Journal économique, October 1761, expressly treats of this distemper: he says, that by the help of a microscope he has discovered worms which had fixed themselves under the epidermis of the leaves.

If the causes of Mildew were certainly known, preservatives against that distemper would, probably, be with more ease discovered; but it is, in the mean time, proper to collect all the observations which the lovers of Agriculture may make on this distemper: these must, of course, be very useful.

M. de Châteauvieux observed, in the autumns of the years 1753 and 1754, that when the corn was mildewed, the second crop of grass on the meadows was affected in the same manner; the leaves from a beautiful green assumed an ugly rusty colour like mildewed corn; the grass was equally dusty, and had every day a sensible diminution. As whole fields of corn are seldom infected in the same manner, the mildew extended over only a part of the meadows.

The same cause, doubtless, produces this distemper both on corn and grass; but the effect is not exactly the same. Annual plants, such as Wheat, may be entirely killed by it: but in perennials, such as the Grass of meadows, it does not kill the plants, the leaves only being injured. But may not their preservation be attributed to the abstraction of the leaves by mowing the meadow? I acknowledge, I have made no observation on that head.

As the straw of smutty or mildewed corn, as well as hay, may create diseases in cattle, it were to be wished that, for the public good, in places where they have much mildewed or smutty fodder, the worst part were laid aside; and that an experiment were made by feeding some particular cattle, to know whether it would have any effect on their health. If, after feeding on it two or three months, they continued well, this fodder might with safety, in future be indiscriminately used; but if, on the contrary, these cattle should be unhappily affected by it, a ready and efficacious remedy would be at hand. By feeding them with good and well-conditioned hay, the disease would soon be got the better of; it would thus be speedily discovered, that the source of this pretended contagious distemper was only to be found in the quality of the fodder.

ART. II.—*Of empty-eared Corn*, (Blés coulés.)

We mean, by empty-eared corn, such as has ears entirely empty at the point, instead of being filled with good grain the whole length; or ears, containing small kernels void of flour, and which run through the sieves with the dust and seeds

This accident, which in some years is common, and considerably lessens the crops, may be produced by several causes.

1. Much cold rain, when the corn is in bloom, may hinder the impregnation; this is often the case with grapes, which remain dry and without juice.

2. Some have attributed it to the effects of lightning; and this is not improbable, as we well know the great effects of Electricity, with which the air so much abounds when the weather is inclinable to be tempestuous.

3. When the corn is putting forth its ear, it sometimes happens to freeze, and this certainly injures the point of the ear; which part can then yield no good grain.

4. I must add, that if by any cause whatever, the course of the vegetation is disordered, or suspended whilst the grain is forming, the grains at the point of the ear, which are last unfolded, suffer most. For this reason, grain well tilled is less subject to this distemper than others: because the constant ploughings, keeping the vegetation always in full vigour, are favourable to the perfect formation of the grain the whole length of the ear.

As the little grains at the points of the ears are not always incapable of sprouting, this distemper cannot always be owing to a want of impregnation.

ART. III.—*Of parched and shrivelled Corn*, (Blés echaudés et retraits.)

When corn appears wrinkled on the outside, instead of being full of flour and smooth on the surface, it is said to be parched and shrivelled. This grain, it is true, yields good flour; but in a small quantity proportioned to its bran, of which it has at least as much as the best conditioned wheat. Yet if the grain is not too much affected, though parched and shrivelled, it sprouts well, and is not totally unfit for sowing.

It is certain that this defect is caused by some accident, which stopped the flux of the nourishment to the kernel, when it was almost formed. Thus the grain, having attained its full growth, but being pushed on to maturity before the farinaceous part was perfected, must, of course, be parched and shrivelled. It is evident that many circumstances may cause this disaster.

1. When corn is laid whilst the kernel is still only a milky substance, the stem being broke, or even only

bent, prevents the food from flowing to the ear; the grains receiving then no more aliment, ripen without being first filled with flour, and remain rugged wrinkled and shrivelled.

2. If, whilst the corn is green, great heats come on, the straw is dried and the grains ripen without being sufficiently filled with flour; sometimes the flower is totally wanting: in either case they are parched.

3 The backward Wheat, and such as has had too much moisture, is most subject to this accident.

4. M. Tull says, that in cold countries there are certain insects which, by piercing the stalks, intercept the course of the sap, and occasion this distemper: but as I have had no opportunity of seeing these insects. I shall not dwell on this matter.

It is then certain, without attempting to exclude other causes, that Wheat laid before the kernels are ripe, yields such as are shrivelled; and that corn pushed on to too hasty a maturity by sudden and great heat, is subject to the same defect as well as to being parched.

ART. IV.—*Of glazed Corn*, (Blés glacés.)

In describing the distempers to which Wheat is subject, we think it incumbent on us to mention a defect not very considerable, it is true, but which lessens the value of corn affected by it; particularly in years of plenty, when buyers are nice.

The knowing dealers require that Wheat should be heavy, and have a smooth surface; that is, that it should not be parched; moreover, its colour must be a bright clear yellow. If it is of a dead white they think it has been damp, and reject it accordingly: if the corn is of a deep yellow, and in part transparent, it is said to be glazed, and they make a difficulty of taking it; this happens to corn that was ripened by great heats, but at a time when flour was nearly formed.

This glazed corn, however, sprouts well, yields plenty of flour, and makes good bread; but I am apt to think this flour does not soak up so great a quantity of water when it is made into dough, as the best meal does: this is the only defect I know in glazed corn; neither am I certain this is a fact. I only mention it in this place, that the Farmer may not be ignorant of an accident, which the dealers are very apt to exaggerate, that they may get such corn the cheaper.

ART. V.—*Of abortive or rickety Corn*, (Blés avortés.)

This distemper came first to my knowledge by means of M. Tillet's papers: it is very rare in our grounds; but I have since had an opportunity of seeing it at M. Trudaine's at Montigny; M. Tillet represents it as very fatal. It shows itself long before Harvest, when the stalk is but eighteen inches high; the mark that characterizes it, is a deformity of the stalk, the leaves, the ear, and even the grain.

The stem of rickety corn is generally shorter than that of other plants of the same age; it is crooked, knotted, in a word, rickety, in the true sense of the word; the leaves are commonly of a bluish green colour, curled up in various ways; sometimes turned like wafer-cakes, and often rolled in a spiral form. The ears have very little of their natural form; they are lean, withered, and show very imperfect rudiments, either of the chaff or grain.

All these symptoms together are only to be found in plants that are in the height of the distemper.—The stalks are often pretty straight, the leaves but little curled, and the chaff tolerably well formed; but, instead of enclosing a small embryo, white and velvetty at the summit, it contains only a green kernel, terminating in a point, not unlike a young pea about to be formed in its pod.

These abortive kernels have often two or three points very visible; they are then fashioned as if two or three small kernels were joined together at the base. When these kernels are ripe, or rather when they are dried up, they grow black, and so much like the seeds of Cockle, that the Husbandmen who know nothing of this distemper, often confound the abortive Wheat with the seeds of that weed.

The following are the principal observations M. Tillet made on this distemper.

1. The abortive ears are generally, produced by rickety stalks of a white colour, with curled leaves.

2. The rickety symptoms appear in the stalks by the time they are three or four inches high.

3. Whilst the rickety stalks are yet low, they are tender and of a yellowish colour; the leaves are of the same colour, a little curled, and as it were, withered, yet rickety plants often appear stronger than the others.

4. As the rickety stalks grow they become green, and afterwards assume the bluish colour which characterizes them: their leaves remain curled, become bluish, and have not the substance of such as are healthy.

5. The rickets is not a distemper peculiar to poor soils. M. Tillet has seen it in rich land in the midst of the finest tufts of wheat, and he has sometimes fruitlessly searched for it in poor lands where the corn was weakly.

6. The roots seemed to partake a little of the same distemper; they were not entirely covered with their spongy coat, and in some places the internal woody substance was apparent.

7. Rickety plants seldom produce ears either entirely good or absolutely abortive; a good ear is sometimes produced by a straight stalk with the leaves a little curled.

8 Abortive kernels are like young peas, and have visibly two or three points.

9 Abortive grain, which commonly grows on rickety stalks, with curled leaves, is sometimes intermixed on the same plant with burnt grain, which grows on straight stalks, with the leaves not curled.

10. Rickety stalks sometimes bear ears which contain some healthy and some abortive grains.

11. Abortive grains scarcely adhere at all to the chaff, and are easily shed when their covering is opened.

12. An abortive grain has seldom the three stamina; there are sometimes but two, and oftener only one, or none at all.

13. The grain is sometimes rendered quite abortive before the ear is unsheathed.

14. When the ears of abortive plants have been some time exposed to the air, the chaff begins to grow white, and the kernels become black and dry.

15. Some stalks of wheat, though of the rickety kind, are straight and tall, and have the leaves of the third and fourth joint only curled: in this case the ear contains, 1. Abortive kernels of one, two, or three parts, 2. Abortive grains enclosed in the same chaff, with white grains furnished with two or three yellow stamina, 3 White grains furnished with three very green stamina, these seem as if they would produce healthy grain.

Thus is this distemper well characterised by observations. I relate them as they are to be found in the dissertation which gained the prize of the Academy of Bordeaux, that a distemper may be made public, which as the author says, is in a manner unknown to almost every husbandman. As I have not had so good an opportunity of observing this distemper as M. Tillet has, I shall omit saying any thing of its causes, or of the precautions that may be taken to guard against it. I shall content myself with saying that M. Tillet suspects this distemper to be occasioned by insects; he says that on the sickly plants where he found insects, he perceived small drops of a very limpid liquor, which he judged to be extravasated sap.

ART. VI—*Of Barren Corn*, (Blés stériles.)

The last distemper I have to mention, is that to which Mr. Aimen gives the name of Sterility.—There are found, he says, in the province he lives in ears of wheat and rye that are long, lean and white, in some the stamina are dry, transparent and horned; the female organs are small, whiter, and less velvetty than in healthy ears; in others the filaments are swelled, the apices void of dust or farina, and the stigmata badly unfolded. The stigmata of all the blossoms of an ear are sometimes dried and parched, at other times the apices are swelled.

M. Aimen thinks with Theophrastus, that these accidents happen to plants that grow with most vigour. Then says he, the sap which is powerfully conveyed into the leaves of the plant or other parts, prevents the organs of fructification from unfolding themselves.

He also imagines that frost may cause this accident, by particularly affecting the female organs; and he thinks that a hot gleam of sunshine coming after a hard shower, may have the same effect. If this is the case, the distemper in question may be ranked with the parched and shrivelled corn, or perhaps with the empty-eared corn; finally the same Naturalist observes, that insects are sometimes, yet very rarely, the cause of this distemper.

ART. VII.—*Of Laid Corn*, (Blés versés.)

The first plants of corn, which having been well tilled and manured, have run up to a great height, are not always those that yield the greatest quantity of grain, or the best conditioned. Corn grows perpendicularly in height, unless accidentally put out of this natural order; the most common accidents are wind and rain. The straw is pliant, and bends, and yields to the wind, but by means of its elasticity, regains its former perpendicular position as soon as the wind ceases to blow: but when rain is added to the wind, the wet makes the ears heavy, and the straw being weak near the earth, breaks. It cannot then immediately rise, and, if there is grass on the ground, it soon over-tops the corn, and prevents its ever rising; for it sometimes happens that the foot of the straw not being broke, if the wind and rain cease, such stalks as were only bent, rise again, and scarcely any damage ensues. But this is not the case when the straw is broke, and the grass over-tops the corn. If this accident happens soon after the bloom, the grain, which is no longer nourished, remains very small, and consists almost of bran alone, the loss then becomes considerable; for, besides the crop of corn being diminished, the straw rots, and becomes unfit for foddering cattle.

If corn is laid when it is near ripe, it only becomes shrivelled; however if the harvest proves warm and dry, it turns to pretty good account, but if it proves wet the corn is very apt to sprout.

If the weather is very windy when the corn is ripe, it shales, and the stalks being interwoven, a great deal is lost on the land, let the reapers be ever so careful.

The corn that is only bent sometimes rises again as I have already said; but if it even does not, it continues to grow, the ears enlarge and are filled in their whole length with grain, which sometimes are not even shrivelled. What is most to be apprehended in laid corn is, the birds lighting on it, devouring the grain, and laying it flat on the ground. These accidents excepted, one may see corn bent without uneasiness; in some cases it is even of use. When corn is bent the point or the ear is next the ground, and the chaff forming a kind of covering to it, the water runs off without stopping in the interstices of the grain, as it does when the ears are upright, and thereby altering the quality of the grain and rendering it less fit for keeping. But although by its being bent the water does not penetrate the ears, still it is certain that an upright position is better adapted to their being dried by the wind; and it is always to be apprehended that bent or inclined corn may be totally laid by long continued rain, when at length it sprouts.

If it could be foreseen that the year would be kindly, we should certainly be cautious of over-dunging good land, lest the corn should be laid, for in kindly years, it is generally the finest corn; whilst that which has been best tilled, and has had most dung, is laid, and turns out least profitable to the Farmer. Last year 1761, the low and seemingly indifferent corn yielded finer and better grain, than what appeared tall and beautiful.

But as it is impossible to foresee what weather will happen, the Farmers till and mend their lands as well as they can; and when they perceive they grow too high they mow them. By this means they backen their growth, which answers the Farmer's intention, who would not have his corn laid.

It is well known that an insulated plant of Wheat, though destitute of support, is never laid. The reason is, that the foot of the stalk, being continually exposed to the action of the air and sun, becomes hard firm, and elastic; whereas the stalks of corn, growing collectively in a field, continue tender near the ground, and are easily broke.

After having treated of the preparations necessary for obtaining a good crop, and the means of guarding as much as possible against the accidents that may endanger its success it is time to say something of getting it in.

PROPOSALS

FOR ESTABLISHING

A NUMBER OF FARMS,

Like those of New England, New York, New Jersey, Pennsylvania, and Delaware. On the south side of the Western Districts of North Carolina, for the mutual benefit of the settlers, and of the trade of Charleston, Wilmington, (N. C.) Fayetteville, Georgetown, (S. C.) Augusta, and Savannah; and of the Planters on the Sea-coast of the two Carolinas, who raise Sugar, Rice, Indigo, Cotton, and Tobacco, and make lumber and Naval Stores, and may not raise Grain or Cattle.

THE WESTERN DISTRICTS OF NORTH CAROLINA.

The lands in the western districts of this state, combine the advantages of being capable to produce and mature the grains, grasses, animals, and fruits of the middle, northern and eastern states, and some of those productions, which the climates, from Pennsylvania inclusively to Vermont, Maine and Indiana, do not suit. On *the head streams* of Santee river, for example, (being Broad, Pacolet and Greene rivers, in North Carolina,) and on the heads of the Catawba, in the same state, the soil and climate will produce and mature wheat, rye barley, oats, spelts, millet, Indian corn, sheep, horned cattle, horses, swine, poultry, turnips, potatoes, cabbages, pumpkins, apples, currants, cherries, flax, hemp, woad and madder, like Pennsylvania, New Jersey, New York, &c. and the lands on those North Carolina rivers, will also produce cotton, indigo, tobacco, upland rice, the wine and raisin grape, the cork tree, the olive, the canary seed, the prune, the fig, the date, the silk worm, the fine woolled sheep of Spain, the superior breeds of horses of Spain and Arabia and the ass and mule of the south of Europe. Iron is very abundant in all the counties upon those waters, and there are many other strong mineral symptoms and appearances. The various mines of Mexico lie due west of North Carolina, and though no deceptive promise ought to be held out, the chances are obvious in the hilly lands and western counties of this state. Mines are constantly found among hills, and even among mountain lands, in all countries.

The counties of the southern states, on *the seaboard*, are so obviously tempted to devote all their attention to cotton, rice, indigo, tobacco, and sugars that they may be considered, in that respect, like the sugar and cotton islands, called the West Indias. They require near settlements, like the Pennsylvania farms, to supply them with all kinds of choice and common flour and meal, common and fat cattle, working and blood horses, mules, swine, mutton, hams, bacon, tongues, tripe, hung beef, butter, lard, and cheese, with many manufactures of wood, metal, yarn, and leather, in peace and especially in war.

It is an ascertained fact, that a barrel of 196 pounds net, of the best Philadelphia superfine flour, with the cask, used to cost in A. D. 1772 to 1775, no more than three dollars and one half to four dollars, in that port, which was then the lowest in America for the best flour. But for the last twelve months, it has been two and one half times that price, viz. 9 to 10 dollars. Flour of the same quality, even in the cheapest markets, on the Chesapeak has been double the old Philadelphia prices of 1772 to 1775. It is also certain that in consequence of the demand in Europe and the West Indies and other wants, the price of superfine flour in Philadelphia on the 1st day of December 1816, was 12 dollars and 50 cents per barrel, and Indian corn was 1 dollar 75 cents per bushel. The counties on the sea-coast, especially around Charleston, will of course have to pay very great prices for grain, bread, bacon, butter, &c. &c. The best flour was worth fifteen dollars at Charleston in November 1816.

Boats, made of wood costing little, can take as many barrels down the Broad river, or Catawba, as several wagons will carry. They have been built at the saw pits, and saw mills, and drawn on wagon wheels to the boatable waters, and launched into them for use. When they arrive in Charleston, they are worth, as lumber, more than they cost in the country.

The distilleries of the United States occasion such a consumption of grain, that the prices of grain, and meal made of grain, are and will always be kept high. By Coxe's statement, made by order of Congress, the spirits distilled in the United States in A. D. 1810, were nearly 26 millions of gallons. Malt liquors, worth nearly one million of dollars, were also made in the same year, entirely from grain. The consumption of grain, meat and grain liquors, by the manufacturers of the United States, who are computed to make goods, (by the same statement,) worth 200,000,000 dollars, is immense. Flour and meat will come high to the country around Charleston and the counties along the sea, for consumption and exportation, unless farms, like the Northern farms, shall be established and multiplied on the rivers leading to their coast, such as Broad river, Pacelot, Catawba, &c. And since men will and must use drink, as well as victuals, the supply of drink (beer, cider and spirits) from our breweries, orchards and distilleries, is very important to all the southern seaboard towns and counties. The molasses and spirits of all the sugar colonies, in the West Indies and South America, are far short of the United States' distillery which was equal to 238,000 puncheons in 1810, besides the malt liquors and cider.

The industry of North Carolina is very great. By the same return (Coxe's statement) it appears, that North Carolina had in 1810 as follows;—Looms for weaving, 40,973: spinning wheels for wool, cotton and flax, 128,484: blacksmith's shops, 3,000: cloths of cotton, flax, wool and hemp, made in that year, were 7,376,154 yards: 20 fulling mills: 79,400 dollars value of hats made: 23 iron works; leather tanned to the value of 396,000 dollars; shoes and boots made to the value of 22,000 dollars; 9 flaxseed oil mills in the western districts (proving the capacity to produce flax, though cotton engages far more attention;) 5,426 stills, making 1,386,691 gallons, value 758,005 dollars; eight gun-powder mills; salt vats: paper mills; rope walks; gunsmiths; tobacco manufactories; very numerous saw mills; grist mills; and cotton ginning mills; saddlers; harness makers; wagon makers; cabinet makers, &c. This statement of manufactories, though far short of the truth, proves great internal industry. The western districts have vast quantities of iron one, with abundance of wood for furnaces, and for charcoal for forges, smith's shops, and manufactures of metal. Pot-ashes and pearl ashes can be manufactured in the district of country spoken of, where the growing wood are generally of the suitable kinds. Boards, plank, scantling, treenails, and ship timber, in rafts, may be floated down the rivers. Quircitron bark, manufactured into powder, can be made, in great quantities, for exportation.

The cork tree may be introduced from Europe and Africa. The olive tree, which produces to France 75 millions of livres per annum, (exceeding 14 millions of dollars) can be produced with certainty in those counties. The Castile and French and Greek white soap manufacture may be introduced, and will give the common olive oil great value. The cheese of Parma, Lombardy, and Switzerland is produced in a similar climate. The fig and the prune and many of the wines of France, with the wine brandy, may be profitably introduced, in the cultivation of the district.

The streams of water are numerous and abundant for mills and works of all kinds to save labour, and for irrigating or watering grounds. It is a fine climate and soil, for every description of melons, and for the sweet and white potato, onions, turnips, cabbages, beets, pumpkins, &c.

The introduction of domestic and general manufacturing, especially of the kinds which consume the raw materials and provisions, wood and building materials upon the spot, is a very plain and very sure mean to promote the prosperity of the country described, and its capacity to supply the lower and coast-country and ports. 856 stills, and 1187 looms, in the two adjoining counties of Lincoln and Rutherford, are proof of the practicability of manufactures of cotton, wool, flax, and hemp, and of grain, fruit, &c.

The state of South Carolina has completed a road from Charleston, by her seat of government (Columbia) through the counties of Rutherford and Buncombe, to Knoxville, by which a western trade is opened to them, and they are made a thoroughfare for all sorts of furs and peltries, salt-petre, and other valuable western goods.

The grand and principal dependence of the sea coast counties and ports, for various supplies (and especially of cattle, and all animals which can be driven to market without expense of carting) must be upon the country on the waters of the Santee, Enoree, Soluda, Broad, Pacolet, Pedee, and Catawba rivers.—That very prosperous and rising city, and most convenient port for the West India trade, Charleston, has the deepest interest in the settlement of all the country on those streams, and that country will have a sure and never failing support in the consumption and exportation of Charleston, and the adjacent ports, and of the great lower and sea-coast planting country.—The grape vines of the vicinity of Champagne, Burgundy, Hockheim, Sauterne, Bordeaux, Oporto, and Xeres (Sherry) ought to be introduced without any delay, and the olive tree of Dauphiny, Provence, and Italy, with the fig of *Smyrna*, the prune and plum of *Tours*, and other parts of France, the currant of *Zante*, and silk-worm of Spain, France, and Italy. The first great benefits will be from the ordinary and necessary articles of supply of country produce, such as the flour, spirits, cattle, horses, sheep, mules, swine, bacon, cheese, butter, tallow, wax, iron, &c. but all the various foreign productions mentioned in this paper, will be necessary to a right system to promote the wealth of the country above-mentioned, and the accommodation and prosperity of the planters and merchants, on that very important and opulent sea-coast, especially in war time.

The productive advantages of climate appear, in visible form, in favour of the counties of Mecklenberg, Lincoln, Rutherford, &c. when it is observed that the incessant frosts of Canada have obliged that government to open their ports on the lakes and the St. Lawrence, for grain, flour and meat, in the months of October and November, 1816, when the grain harvest and fatted cattle ought to have been most abundant. The waste of food and expense of fuel, in long winters destroy the farmer's profits.

The rapid growth of white population, in the middle and western districts of North Carolina, indisputably prove it to be a very healthy country.

The markets of Augusta in Georgia, Fayetteville, and other places in North Carolina, and the towns on the French Broad, as well as Charleston, have a convenient and beneficial bearing upon the country on the Pedee, Catawba, and Broad rivers, so as to ensure its steady progress and great prosperity.

In 1810, the population of North Carolina was 555,500 persons. Lincoln, Rutherford and Buncombe had in that year 53,110 persons. The population of those three counties is probably now little short of that of the Delaware state.

The maple sugar, though not so much manufactured in North Carolina as it might be, is a sure, convenient and promising production of the soil, climate, and natural growth of wood there. In the year 1810, the quantity of 162,340 pounds was made in the eastern district only, of the state of Tennessee, which joins North Carolina, and is in the same latitudes:

,471,647 pounds of maple sugar were made in the same year in Kentucky.

The woods, which grow on the waters of the Broad, Greene, Pacolet, Catawba, &c. are the oak of various kinds, hickory, locust, pine, poplar, maple, post oak, persimmon, buckeye, wildcherry and chesnut. The grape vine is large, and frequent.

All kinds of family manufactures prevail in the state of North Carolina, as the looms and spinning wheels prove. The water cotton ginning mill is erected in numerous places. The carding and spinning machinery and water loom would be probably introduced in the counties in the western districts, which could make cotton yarn and cloths on terms to bear transportation to market and yield great profits, being raised on cheap lands, compared with the flax lands of the middle, northern and eastern states. Air furnaces for iron castings, rolling, slitting and nail water-mills, steel works, iron works in general, white and green glass works, potteries, tanneries, the turnery, manufactures of leather of all kinds; fine hats, wool hats for the labourers below, pot ashes, pearl ashes, and the most choice and valuable breeds of animals, hold out the plainest and strongest invitations for attention, to the body of farmers, merchants, and capitalists.

It will be useful to observe, that wheat, barley, oats, sheep, horses, mules and horned cattle are produced in great quantities in the four Barbary states of Morocco, Algiers, Tunis, and Tripoli, though the climate is much warmer than even Louisiana and Florida. Morocco lies in 28 to nearly 36 north latitude, and near its north angle the climate is so warm that at the port of *Tetuan*, oranges are sold at 3*s.* 6*d* sterling, less than 78 cents. per thousand. Nearly all Morocco lies south of the latitude of Tetuan, yet all Morocco produces wheat even in the 28th degree of N. latitude. In Kentucky, Tennessee, North Carolina, South Carolina and Georgia, wheat, barley, oats and apples grow in all the oak and hickory country, as well as on the Chesapeak, Susquehannah, Delaware, and Hudson. The peach grows in all the same southern countries of America and Africa, in the greatest perfection, for the table, for drying and for the still.

The state of Tennessee, having 261,727 inhabitants, of which only 44,535 are slaves, forms a most respectable and effectual frontier, against the Indians, who have long ceased to assail North Carolina.

The distance of the Lincoln and Rutherford farmers from the sea is not greater than that of the residences of Presidents Jefferson and Madison, and besides the present natural navigation of the Catawba, Broad and Pacolet rivers, there is an excellent navigation from the adjoining counties of South Carolina to Charleston, so as greatly to diminish the expense of transportation. It is capable of material improvement. Cattle have been driven, at less than one dollar per head, from the western or Morgan district in North Carolina, to Philadelphia, and they can therefore be conveniently driven one third of the distance, from the North Carolina counties on Broad and Catawba rivers, to Fayetteville, Georgetown, Charleston, Augusta, and Savannah river.

Cattle have been brought to Philadelphia from the counties of New York, on the streams emptying into lake Ontario and the St. Lawrence, to the number of 8 or 9000 head in a season. The distance was, in most instances, above 300 miles, and, in very few less than 200 miles, which is the distance from those North Carolina rivers and counties to Charleston. The total export of live cattle from the United States has been from 4500 to 8000 head in a year. Superior breeding animals ought to be made an object of *primary* and *unceasing* attention, in the farming settlements, on the upper waters, destined to supply Charleston, Fayetteville and all the sea-coast, with horses, cattle, mules, sheep, swine, &c. Washington county in Pennsylvania, is 300 miles west of Philadelphia, on the Ohio river, and on the western boundary of Pennsylvania.—That county had, in A. D. 1810, 36,289 people; 47,206 sheep (more than any other county of Pennsylvania;) 8763 spinning wheels; 1744 weavers, chiefly men; 4115 pairs of hand cards; 6 carding machines; 2 fulling mills; 301 distilleries; 146 blacksmith's shops; 20 hatters; 19 saddlers; made 37,000 pair of shoes and boots; had 62 coopers; made 530,775 yards of woollen, hempen, flaxen and cotton cloths, importing its cotton from Tennessee, &c.; made 913,000 bricks; had also 4 oil mills; 65 sawmills; 110 flour mills; 9 potteries; powder mills: 34 tanneries; 7 naileries; 3 breweries; made 3536 saddles and bridles; 8 cuttlers and coppersmiths; 6 cotton manufacturing establishments; no iron works, being without much ore, built 70 tons of vessels; had 17 cabinet makers; made wagons worth 3,540 dollars, and other manufactories, worth in all 1,630,000 dollars for that single year.—The return of neat cattle of the same county of Washington for the same year was 34,985, and of horses 17,391. The horses were about equal to those of the greatest county in the state, and the neat cattle were more numerous than those of 35 out of 40 counties. It is a fair and real example of what may be done in the counties on the Catawba, Broad and Pacolet rivers, which are nearer to Charleston than Washington county (of Pennsylvania) is to Philadelphia, Baltimore, Washington city, Georgetown and Alexandria.

The Bohemia German glass works send their wares to Hamburg and Trieste, which are greater distances than from the North Carolina counties above-mentioned to the sea.

The peach brandy distillery of North Carolina yields a very elegant liquor, and if made of sixth proof, for reduction to 4th proof by fine water in Charleston, would complete with the best French Cognac or Bordeaux brandy, to the utmost advantage.

The capacity of the climate to produce rice in the country on the North Carolina streams, which flow into the Broad, Pacolet and Catawba rivers, may be relied on. It is well known, that the farmers there now raise only small quantities of rice, as they formerly raised small quantities of cotton. But the capacity of the counties, along the south side of North Carolina, to produce rice is certain. It is important to remark, that the rice of *Piedmont* is well known, in the markets of France, England, Holland and Germany; and Piedmont is between 44 degrees 15 minutes, and 45 deg. 50 min. N. latitude, and is (in the temperature of Turin to Novara,) about equal to Rutherford and Lincoln, in North Carolina. The produce of Piedmont is wheat, the wine grape, and other fruits, rice in plenty, hemp, flax, silk, Indian corn, there called maize, the olive and the fig, with horses, horned cattle, sheep, swine, asses and mules.

Lucca, famous for olive oil, is in 44 deg. and Provence, in France is in 44 deg. 30 min. producing the best of that kind of oil.

It is a remarkable fact that the return of manufactures of the United States makes the quantity of spirits distilled in Kentucky 2,220,723 gallons and values those spirits at 740,242 dolls. and the same return of manufactures states the quantity of spirits distilled, in the same year, in North Carolina, at 1,386,691 gallons, and values that quantity at 758,936 dollars.—The two causes of this difference of value are, that a much larger proportion of the North Carolina spirits is the exquisite and valuable peach brandy, while those of Kentucky are, in a much greater proportion, grain spirits The other cause is, that the North Carolina distilleries have the benefit of selling to the numerous sea-coast planters of sugar, rice, indigo, cotton, and tobacco, who will not suffer their labourers to lose their time in raising grain and fruit to distill. The western or Morgan district of North Carolina had, in 1810, one fourth of the stills of that state.

The climates of Lombardy and Parma in Italy resembles that of the counties under consideration. It produces wheat, maize, olives, olive oil, flax, hemp, the best mulberry tree, silk, the wine grape, the fig, the finest cheese in the world, butter and vast numbers of horses, sheep, cattle, asses, mules and swine.

The object of these inquiries and observations about the climates and valuable productions of other countries, is to prove to the farmers, planters, merchants and others, how greatly the upper country is neglected, though capable of pouring, as from many fountains, a stream of comfortable and beneficial abundance on the lower planting counties, and into the seaport towns, for home consumption and exportation, to the great profit of the northern, eastern and European farmers, who may buy and settle there.

It may be useful to remark, that the climates of Europe and America are considered to compare, in warmth or in temperature; in the following manner. America in 35 deg. north latitude is considered to be as warm, for vegetation and production, as the European 45th deg. Thus St. Mary's. in Georgia, is about as warm, for vegetation, as Oporto in Portugal, and the productions of Europe, in any given latitude, may be found in or introduced into the United States, in latitudes nine or ten degrees further south. The pride of all Europe, in wines, is certainly the wines of the following places.

Champagne in latitude 49° N. in Europe equal to 39° to 40° in United States.

Burgundy	48	= to 38 to 39
Old Hock wine	49	= to 39 to 40
Bordeaux Claret and Sauterne	45	= to 35 to 36
Best brandy of the wine grape; Bordeax and Cognac.	45	= to 35 to 36
Rice has been produced in	45 Dauphiny, Fr.	= to 35 to 36
Rice from Turin to Novara, in Piedmont gives plentiful crops	45¾	= to 35¾ to 36¾
Olives commence as high as Lyons, Grenoble, and Chamberry	45 30 Savoy	= to 35½ to 36½
The wine district of Europe for the finest wines from Xeres to Epernay in Champagne	37¼ to 49	= to 28¾ to 39 and 40

Apples grow and produce well every where in Europe, except where the wine and brandy interfere with the use of cider. In America the apple produces well, for the table and for cider and for the distillery, because the grape does not yet interfere with the production of apples and with cider in the southern states of America. But northern farmers can and will propagate the apple in a greater degree, and with much pleasure and advantage.

The legislature of South Carolina have established an incorporated company to improve the navigation of the Pacolet and Broad rivers, by locks and hydraulic constructions and operations.

The shad fish regularly ascend from the sea into the counties of Rutherford, Lincoln, Rowan, &c. by the Broad river, Catawba, and Pedee, and are at once a convenience to the farmers, and an evidence of improvable navigation.

The prosperity of Charleston and of the sea-ports of Norfolk in Virginia, Newbern, Wilmington, Edenton, Beaufort, Plymouth and Washington, &c. in North Carolina, and of Georgetown, in South Carolina, are strong evidences of the agricultural, manufacturing and commercial advantages of North Carolina, which sends a great quantity and value of goods to those places. The exports of Charleston alone have amounted, in a single year, to 14,304,000 dollars of domestic and foreign goods. A very large proportion of the production of North Carolina also go, coastwise, to the other states, and therefore do not appear in the returns of exports, which only notice exports to foreign places.

In the time of president Washington, North Carolina and Tennessee were one state. By the census of 1810, North Carolina alone had a population of 555,500 persons.

Tennessee had besides	261,727
Total population	827,227
Pennsylvania in A. D. 1810 had	810,091
Massachusetts and Maine had	700,795

The most convenient approaches to Lincoln and Rutherford by sea are *first*, by way of Wilmington in North Carolina on Cape Fear river, and thence by an excellent boat navigation to Fayetteville, a town of 400

to 500 houses, thence by wagons to Charlotte, Lincolnton and Rutherfordton; or *secondly*, by Charleston in South Carolina, and thence by wagons to Lincolnton or Rutherfordton.

The town of Fayetteville (North Carolina) is now actually very considerable in the manufactory of wheat flour, and in the autumn of 1816 the highest priced flour in the Charleston market was stated, in their gazettes, to be the *Camden* (South Carolina) flour, which two facts prove the capacity of the soil and climate for good wheat. The southern white wheat degenerates into red, in the northern parts of America.

The wheat bread of *Cagliari* in the island of Sardinia is said to be the whitest on the Mediterranean sea, and very fine. The flour is made of the wheat of that island, where oranges, dates, grapes, figs, &c. grow in abundance, The latitude of *Cagliari* is 39 degrees North in Europe, equal in America to 29 or 30 degrees. The South is favourable to wheat.

OBSERVATIONS

On Improving Land Generally—on the Use of Plaster—on the Three Horse Plough—on Preventing Land from Washing—on the Culture of Indian Corn—on the Use and Construction of Harrows—the Manner of Making and Applying Manure—on the Management of Cattle and the Rotation of Crops.

In a letter from *Thomas Marshall*, Oak-Hill, Fauquier County, Va. April 22d, 1819, to *George W. Jeffreys*, of North Carolina—Communicated for publication in the American Farmer.

Oak-Hill, Fauquier County, Va. April 22d, 1819.

Dear Sir,—I could not be so insensible to the civility manifested in your letter of the 23d February, as to have delayed answering it thus long, if it had come to hand in due time; but in consequence of a long absence from home, I did not receive it until a few days past. I avail myself of the first opportunity to return you my acknowledgments, and comply with your requests.

It would be a happy circumstance if candour would allow me to admit, by silent acquiescence, the claim to superiority which you suppose me to possess. The truth is, I am but an inexperienced farmer, and able to give you little information on the diversified subjects of agriculture. That little, I have for the most part acquired from others, and feel bound to communicate in return to any who may require it.

The farm on which I reside consisted, a few years past, of a number of tenements, some of which had been considerably improved, while others were almost at the lowest ebb of agricultural degradation. Different treatment was therefore required in the management of the different fields; and a fondness for system yielded to the necessity of unequal cropping, arising from the unequal condition of the fields. The difficulty too of dividing the land advantageously, and the great distance of the rail timber, were additional obstacles. However, after making an accurate survey of all the arable land, I was enabled to lay it off into eight equal or nearly equal fields, and have been gradually carrying the scheme into execution. There were other divisions in view at different times, but not acted upon. At present, the final arrangement of the fields is nearly completed, and in several of them the plan has been for some years in operation.—I have never yet been able to fallow three fields.

Plaster of Paris has an effect so strikingly beneficial upon our soil, which is for the most part a light loam with a coarse porous foundation, equally favourable to grain and grass, that the exhausted fields upon the farm have improved with astonishing rapidity in consequence of the free use of that article. Besides this, I have been careful to manure all the poor knolls, partly by penning the cattle upon them, and partly by the litter of the farm-yard and stables. Another means of improving the soil to which I have paid a great deal of anxious attention, has been the mode of ploughing.—We break up the land with large three-horse ploughs, with iron mould-boards, which turns the sod over effectually. Each furrow may be said to be about 6½ inches deep, and thirteen wide. Under favourable circumstances the depth is rather more considerable, and the width from 13 to 17 inches. A three-horse plough, with which perhaps you may not be conversant, is never made to take land; that is, the lines of direction of the beam and of the coulter, do not intersect each other as in a two-horse plough. The horses move abreast, one in the furrow, and two on the unbroken ground. Swingle-trees of three different sizes are made use of; one about four feet long, one rather more than three, say three feet 4 inches; and three smaller ones to which the traces are fixed. The longest, which serves the purpose of a lever, is laid off into three equal parts, and connected in the usual manner at one of three points of division, to the end of the plough beam. Two-thirds of this piece are given to one horse, who draws by means of a chain connecting the long arm of the lever with his small swingle-tree; the chain being made long enough to let his head range with the heads of the other horses. These horses are connected with the short-arm of the lever by the intervention of the second sized swingle-tree, to either end of which a small one is attached. With this description you will readily understand the annexed sketch. This mode of attaching three horses to a plough is almost universal in this quarter of the country, and I should not have thought of noticing it at present, if I had not perceived that it was unknown in some parts of this state, where the application of it would be useful. By working three horses abreast, their respective lines of draught are nearly in the same plane, two of them evidently so; and it is probably that they can accomplish nearly the same work as four horses fixed in the usual way, and the plough must certainly run with more steadiness and uniformity.

The surface of our land undulates considerably, and to avoid washing, we lay off the lands in such a way as to cast the furrows down-hill, as much as circumstances will allow. The eye is the only guide, and the master's eye answers the purpose very well. If bedding were admitted into our cultivation, I might perhaps adopt the beautiful plan of horizontal ploughing, which has been used in Albemarle, and some other counties of this state. But our soil is not prone to wash, and ordinary care corrects any tendency of the kind. Since the introduction of deep ploughing and clover, the old gullies have in some instances disappeared almost without an effort to fill them, and new ones are never formed. Some little impediments are thrown into these washes occasionally; care is taken never to break the grass, which after a time appears in the bottom; the sides are broken in; and in process of time, they cease to disfigure the land.

The "manner of preparing the ground for and cultivating Indian corn," depends so much upon the quality of the field and the nature of the season, that a general answer must be given to your inquiry on that head. The field whether in grass or stubble, I endeavour to have ploughed the preceding autumn; the difference between the two is wonderful and decidedly in favour of the stubble land, although it is somewhat troublesome to turn over in the first instance. In the spring, a stiff soil should be ploughed I presume a second time before planting, but our soil is sufficiently reduced by the use of a large square harrow drawn by three horses. The land is laid off in rows of five feet, and crossed at intervals of 3 or 3½ feet, and the corn planted. After it comes up, two stalks are allowed to stand in a hill, if hill it may be called; for we are careful to cultivate our ground with as smooth a surface as possible. This is effected in a great measure by the frequent use of the above-mentioned harrow, and a smaller implement of nearly the same nature of triangular appearance and drawn by one horse, which we call a cultivator. Shortly after the corn appears above the surface, we plough it the wide way with shovels, a light single horse-plough without a coulter or mould-board, which runs deep at will, and casts the earth equally to either side, and is admirably adapted to the cultivation of strong stony land.—The next operation is to run the large harrows in the same direction with two horses to each, and if they should prove too wide for the rows, some of the teeth may be removed. As soon afterwards as is thought requisite, the ground is ploughed the narrow way, and that ploughing is followed by the cultivators; indeed it is a rule to be invariably observed that every operation with a plough in a corn field, should be followed by a harrow of some sort. Good ground, previously well worked, will require no farther ploughing for that crop, but will be the better for an occasional use of the cultivators. Some aid from hoe-work during the season, we find indispensable; and here as elsewhere, no proper opportunity for thinning, suckering, &c. should be lost.

In the cultivation of Indian corn we use, as before observed, two descriptions of harrows.—The large one which I called square, is in fact of an oblique shape; one diagonal being about seven and a half feet long, whilst the other does not exceed five and a half or six feet. The frame consists of five pieces of oak, five inches wide and three and a half thick. The parallel pieces are not connected at one end (except by a small slat, an inch thick, which passes through them,) in order that the stones may escape; and for the same purpose the pieces are not exactly parallel, but diverge a little from the head. A harrow of this shape works more steadily than a square one. In the construction of all implements of this description, it is important

that the teeth should be placed, not at equal distances from each other, but in such a manner as to cut at equal intervals. Hence if the line of draught can be ascertained, it will be easy, by drawing parallel lines upon the back of the harrow frame,—to prick off the places where the teeth should be inserted; and although they may have an irregular appearance upon the frame, they will make a regular impression on the ground. This is what I have done, and my harrows have worked well.—The best way to ascertain the line of draught would probably be to have the horses hitched to the frame before boring the holes. A gentleman of my acquaintance says, that he has applied a horizontal clavisse with great advantage to his harrows. It is semi-oval, and nailed to the fore-part of the frame. The chain by which the machine is drawn passes through this, and by varying the notch, the harrow teeth may be made to cut at greater or less intervals at pleasure, but it does not prevent inequalities in the relative position of the teeth. the teeth are made of $1\frac{1}{4}$ inch iron, 14 or 15 inches long. The *cultivators* are formed of two small pieces of oak scantling, with a curved beak of the root of locust or some other tough wood, by which they are drawn. The frame is secured with bands of iron, and furnished with two handles. As the line of draught is easily ascertained in consequence of the uniformity of shape of the cultivator, very little ingenuity is required in the workman to lay off the holes properly, and to insert the teeth in such a manner that they shall all cut fore and aft. These implements are furnished with five or seven teeth or rather hoes, of a curved shape, and brought to a point like a pointed spade or shovel. In the widest part, they do not exceed four inches. Each tooth has a shank to it which passes through the wood, and is secured on the upper surface with bits of iron like linch pins and washers. Cultivators generally cut about two and a half feet wide.

"The extent to which I use the plaster of Paris." is considerable. It is mixed, or to use the term best known here, rolled with the Seed wheat at the rate of one bushel of plaster to two of wheat; a top dressing, varying from two to four pecks, is applied in the spring unless the wheat should be very luxuriant. We give a similar top dressing to all our fields, which are not to be fallowed that year, and to the meadows. The seed corn also is rolled in plaster, and the field receives a dressing broad cast, when the corn attains the height of two or three feet.

There is nothing in my "manner of making and applying manure," which lays claim to any sort of originality, or would be worth communicating to a farmer, evidently such a proficient as yourself. Suffice it to say, that my cattle are folded every night in the summer; that they are pened in the winter, fed upon the offal of wheat and corn; and that no time is lost in casting the manure out upon the fields. A gentleman of the lower country, whom I consider as one of the best farmers in this state, makes it an invariable rule to have the manure from his stables, and that from his farm pens, carted to a place of deposit near the ground to be manured, and there mixed together. A fermentation quickly ensues; the litter from the farm pens is greatly improved by combination with the richer manure from the stable which is abundant in quantity, because the horses were always well supplied with good beds of straw; and the whole mass in a few days becomes nearly homogeneous and fit for spreading on the field.

"As to the manner in which my cattle are supported during the spring months, so much depends on the season, that I can give no definite answer. Like you I have several water courses running through my farm, and one of them is bordered by an extensive meadow, which yields a great quantity of hay. Besides this source of supply, we obtain a great deal of hay from the clover fields before harvest.—The present season has been so favourable to vegetation that the cattle reject the hay, and as I am desirous of fattening about fifty of them for an early market, I do not think it prudent to confine them and to force them to subsist on hay. As to the farm cattle, as they are called in contradistinction to those which were purchased from the drovers they are turned out into the neighbouring woods. Being attached to the place, they come up voluntarily every night and are folded in a field, which is soon to be ploughed for wheat. In a less genial season, I should have to confine them, and they would be glad enough to eat the hay.

I lament my incompetency to recommend any system or rotation of crops for your land, which from your description must be of valuable quality. Your own experience and observation will be the best guide. Before bidding you adieu, I cannot forbear recommending to you, if the plan be not already adopted, to keep a regular journal of your agricultural proceedings. It will enable you to correct errors into which you may have formerly been seduced; to compare the state of forwardness in which your business may be at any given time, with what it was in preceding years; to account for many phenomena by being able to recur to the state of the earth or of the atmosphere at some preceding period; and will prove a source at once of instruction and delight.

I remain dear sir,

Very respectfully yours, &c.

THOMAS MARSHALL.

G. W. Jeffreys, Esq.

Mr. Marshall's letter represented a plough with the swingle-trees annexed—but as it was not intended to illustrate the form of any particular plough, but introduced only to shew the manner of attaching the three horses—we have omitted the drawing of the plough, except the end of the beam, at letter K.

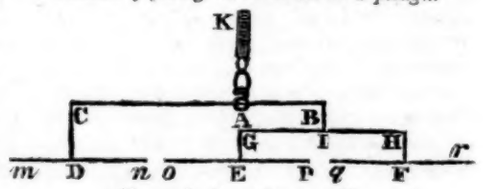
This construction of the double and single trees, depends on a well known property of the lever; namely that it will be in equilibrium when the forces, applied to any points of its arms are inversely proportionable to their distance from the *fulcrum*, or centre of motion. Any weight or force, applied at C, will therefore balance double that force, applied at half that distance B, A being the fulcrum. Again the force at B, is the same as at I, the fulcrum of the lever G, H; and since GI and IH, are equal, half the force at I, will be exerted at each end of the lever GH. or which is the same at E and F. And for the same reason, half of the forces at E and F, will be exerted at O, P, *q* and *r*, respectively. Since then the force applied at B or I, is double that at C, or D; and the force at E or F, half that at I, it is evident that the force of C or D, is equal to that of E or F, when the levers are all in equilibrium. Lastly, since the arms of the three levers *m n*, O P, *q r*, are all equal, the forces of their extremities will be equal, when in equilibrium; and the whole force exerted at A, will be divided into six equal forces at their extremities, or which is the same, the power applied to move the plough will be divided into six equal forces exerted on the six chains or traces, and consequently exerted equally by the three horses.

The necessity of accurately dividing the double tree, will appear from the following example.

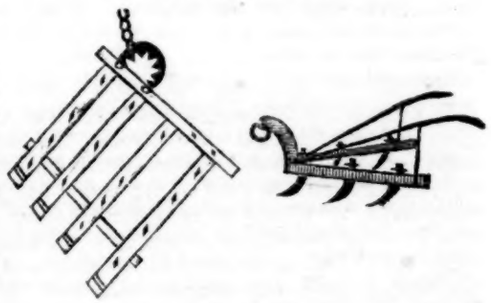
Suppose its length 40 inches, and that instead of having having its arms 13 1-3 and 26 2-3, they are 14 and 26.—Suppose also that each horse exerts a force, which is equal 75 lbs. weight the whole force being 225 lbs. Then as 40 are to 225, so are 14 to 78 3-4 lbs.; the force to be exerted by the horse at C, which is 3 1-4 lbs. more than his share. In like manner, if it were divided into 25 and 15, it will be found that he would have a pressure of 84 3-8 instead of 75 lbs.

Editor American Farmer.

Method of fixing three horses to a plough.

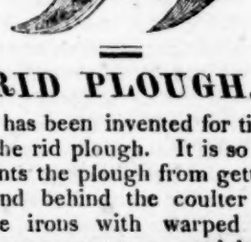


Form of a large harrow, &c.



Shovel Plough.

Form of Shovel. *Cultivator tooth enlarged.*



RID PLOUGH.

A plough has been invented for tilling rough land called the rid plough. It is so constructed that it prevents the plough from getting choked up before and behind the coulter and in the point of the irons with warped grasses or weeds, fresh sea ware, straw, yard dung, or even a rough stubble in wet weather, and will go as clear through a field of full-grown grain as on a smooth lea, and nothing will stop it save stock and stones. It is thus of the greatest importance to the farmer, when the loss of time, waste of strength of man and horses, and in-

adequate manner in which the work is performed by ordinary ploughs are considered. The principal alteration is in the beam and coulter, and it is easier guided and drawn than the common plough.—*Ayr. Advertiser.*

TO THE EDITOR OF THE AMERICAN FARMER.

Washington, 29th Oct. 1820.

JOHN S. SKINNER, ESQ.

Sir—Observing the above notice in a paper, under the agricultural head, concerning an improved plough, calculated for grassy soils, I take the liberty of enclosing it to you, and beg leave to call your attention to it. If we can procure a plough of that description, I do not know any thing so likely to benefit the husbandry of North Carolina as its introduction, particularly the lower district, and I presume the same evil exists all along the lower coasts of the southern states, arising from the luxuriant growth of wild grass; which makes ploughing difficult and necessarily frequent. This plough is represented, as being well calculated to penetrate through grassy and weedy soils; while, with our present ploughs, a great deal of time is lost by frequent stopping to rid them of the grass and weeds, with which they are continually choked. We have a species of grass called the fox-tail, also the crab grass; but the hardest of all to break up is the broom grass, and we are generally obliged to use two yoke of oxen with slow and laborious efforts to tear up their roots and fibres. Our grounds are naturally rich enough for wheat, but it costs us so much labour to put them in order, and the wheat grows so rank, that we do not raise as much per acre *in grain*, as you do on your ordinary grounds. As to our corn, we certainly bestow twice the labour on its culture that the people of the middle and northern states do on theirs. We have to plough it over five times at least, and work it four times with the hoe. We have scarce time to go over a field once, before the grass shoots up in the first rows, and if there be an intermission of more than two weeks, our corn is taken by the "green squirrel." In passing through Jefferson county in Virginia, about seeding time, I have envied the farmer his great facility which the lightness of his soil gave him; and having very little grass to impede his progress, he is thus enabled to divide his force, to break up his land easily with one horse,* and by that means to sow two or three acres to our one.

I heartily congratulate my countrymen then, upon the invention of this plough. I hope it may speedily be introduced among us, and I will undertake to ensure in that case, that every farmer amongst us, who can afford it, will supply himself with one or more of them: and that the patentee or workmen will be well rewarded for his genius or his pains.

I am very respectfully sir,
Yours, &c. &c.

* That is, after having first fallowed it with three horses. *Ed. Am. Far.*

TO THE
FARMERS OF THE WESTERN COUNTRY.

Improvements in agriculture and in agricultural implements are at all times of the first importance to our country; but particularly so in these times of pressure and distress. If it be a fact that every dollar which we handle, is first dug out of the earth—if it be a fact that on the farming interest of our country, every other department depends—then is every individual deeply interested in promoting *this* great and important object.

The subscriber has been for years engaged in endeavouring to make improvements in the implements of husbandry and in the method of culture; and as the Plough and the Harrow claim the pre-eminence, he has spared neither time, labour nor expense to bring them to what he considers the highest state of perfection.

His method of cultivating, is this :—in the earliest planting season, he runs his harrow over the stocks, which tears them down and cuts them to pieces with its teeth, which are *inclined*, and sharp as a knife. This done, he begins to *break up his ground*, which after being again harrowed he proceeds to lay off, (only one way) at the distance of four and a half or five feet, his *dropper* then moving along in the furrow, at a common walk, drops, for a hill of corn, *at every step*;—he then runs his harrow over the ground with a *leveller* attached to the hinder part, which mashes all the remaining clods and leaves the soil completely pulverised and level as a plank. The corn springs up through the ground thus prepared, and grows rapidly. When it is nearly half leg high, he runs his *Log Plough* on each side of the row close to the corn, and having thinned it, leaving from two to three stalks in a hill, he leaves it until it grows to be knee high or a little more, he then finishes ploughing it and lays it by.

In this way and with half the labour required in the common method, you will raise one third more grain from the acre, and instead of exhausting your land by repeated ploughing and hoeing, this plan of culture will improve it. The harrow is also well calculated for preparing meadow ground. One of the many advantages of the *log plough* is, that it will run through the foulest ground without choking, so that a man can plough one third more with it in the same time than he can with any other kind now in use. It is, however, unnecessary to eulogise on paper these important utensils, as they will fully demonstrate their ulility when exhibited to an enlightened and impartial public.

THOMAS PULLEN.

Bourbon County, Ky.
Sept. 22, 1820.

N. B. The inventor has made application for a *patent.*

We do hereby certify that we have seen Thomas Pullen's newly invented Log Plough in operation, and are fully convinced of its great utility to the farming interest of our country, especially in the cultivation of Indian corn. We have also observed his method of cultivating this invaluable grain, and are satisfied that it requires not half the labour necessary in the common mode. We have therefore no doubt but his newly invented *plough* and *harrow* will meet with the approbation and be adopted by every intelligent farmer who may have an opportunity of witnessing their great utility.

WILLIAM PHILLIPS,
GEORGE E. MOORE.

Sept. 22, 1820.

The foregoing reminds us of our friend RUSTICUS, from whom we should be glad to hear more frequently. His communication respecting the use of the harrow and roller united, for planting Indian corn, has been a long time on file, and shall now be inserted; perhaps in the next number, certainly in the course of this month. *Ed. Am. Far.*

TO THE EDITOR OF THE AMERICAN FARMER.

Talbot County, Oct. 25th, 1820.

SIR—In one of your numbers published sometime since, I was much pleased with the train of Mr. Quincy's remarks, and not a litttle struck with one of his observations—"I never lay down a field in grass under 14 inches ploughing."—Every one who has the slightest pretensions to be called a farmer, will agree, that the deeper you tilth cæteris paribus, the more abundant will be your crops. But as a general position, what Mr. Quincy also says is incontestible, "the deeper you plough, the heavier you must manure." And as deep ploughing is extremely laborious, and but few of our farmers have yet developed the resources of heavy manuring; I fear it will be long before Mr. Quincy's practice will be generally followed. That the success of a crop of mangel wurtzel, or ruta baga, or carrots, or parsnips, or other tap roots, will depend nearly as much upon deep cultivation, as upon good manuring, there can scarcely be a doubt.—But wheat, corn, tobacco and hay, are the staples of Maryland; and I suspect a great majority of our farmers and planters entertain doubts of the necessity of deep ploughing for these crops. I have seen fifty bushels of corn grow to the acre on an average turning of five inches, and shallow or surface cultivation the remainder of the season, and that season was remarkably dry. I have seen wheat grow at the rate of 45 bushels to the acre after a cultivation not exceeding four inches, and on ground which never had been broken deeper, and yet I am decidedly an advocate for deep ploughing. But on this, or exhausted land, it certainly should be done gradatim, and should never be thought of unless the manure accompany it, the quantity increasing with the descent of the share. Very general doubts however certainly exist on this subject as regards our staples, and it strikes me as a question extremely material to have decided. The question may fairly be stated thus, whether the crop of tobacco, wheat, corn, or grass on a fourteen inch tilth would be so much more abundant than on a tilth of four or five inches, as to pay for the extra labour? And I would throw out the following suggestions for the elucidation and settlement of this question. Let an acre of land where the productive soil is thin both in quality and in number of inches, and the substratum a caput mortum till enlivened by the plough share and manure be chosen. Cover this acre with 25 cart loads of manure, turn the first half of it three inches deep, the 2nd. five inches, harrow each well to the respective depths of ploughing—Again cover the acre with twenty-five more loads of manure, and plough the first half four inches deep; the 2nd. half eight inches, and harrow well to the depths of the ploughings—a third time cover the acre with twenty-five loads of manure, and plough in the first half five inches deep, the second half eleven, harrow well to the respectivive depths of ploughings.

A fourth time cover the acre with 25 loads of manure, and plough the first half 5 inches, and the 2d. 14 inches, and harrow thoroughly to the respective depths of the ploughings. Keeping an exact account of the difference of the force required in the several ploughings and harrowings of the two parts, and of the difference in the expense, taking in the increased size and cost of ploughs, strength of gears, &c. for the deep ploughings. It would be extremely gratifying to have this experiment commenced immediately by half a dozen judicious agriculturists, who would keep accurate accounts of the process and results. The several manurings, ploughings, and harrowings might be completed by the middle of next May, and then one half of the deep ploughed half acre might be planted in corn, and also one half of the shallow ploughed half acre—and the other two quarter acres pitched in tobacco. These crops might both be made and off by the first of October, when the whole acre might be laid down in wheat, keeping accurate accounts of the season, and of the growth, appearance and quantity produced of each crop, on each depth of tilth. After the wheat shall have been reaped, I would burn off the stubble, and cover the acre with 50 loads of manure, plough and harrow thoroughly—the first half 5 inches deep—the 2d. half 14 inches, and lay the whole acre down plentifully in good grass seed, and keep accurate accounts of the respective crops of grass and hay.

I would also beg leave to suggest, that the agriculturists, who have it most in their power to execute these experiments, and indeed to amuse themselves with them, are the intelligent agriculturists residing in and near Baltimore—as Mr. Robert Smith, Mr. Oliver, Mr. Gibson, Mr. Cox, Mr. Cromwell, Mr. Rodgers, General Ridgely, Dr. Thomas, Mr. Dorsey, &c. &c. and if they can prove that the increase of crops on the deep tilth will pay handsomely for the necessary increase of labour, expense of implements, &c. they will do a real service to agriculture, give an increased stimulus to good cultivation, and highly gratify the lovers of deep ploughing. A perfectly accurate description of the land on which they operate, should not be omitted.

FARIUS CRESCIUES.*

* We have probably failed in deciphering the signature, but the above is as near as we can come to it; we had rather have the *real name* of such a writer and reasoner, than a thousand fictitious signatures, such as *Rusticus, &c. &c.*

BALTIMORE, OCT. 31.

Mr. J. Green of Annapolis has just published a new edition of the laws of Maryland, revised and prepared under the authority of the Legislature, by the honourable William Killy, Chancellor of this state, Thomas Harris, Esq. Clerk of the Court of appeals, W. S. and John N. Watkins, Esqs. A work of this description has long been wanting in this state, and the well established character of the gentlemen who have prepared this edition for publication, is a sure pledge to the public that it has been well executed. This edition of the laws of our state has annexed to it a very copious and well arranged index, and an appendix containing the old land laws, omitted in all the former editions; the Resolutions passed since the Revolution, which are considered proper or necessary o be preserved; a collection of all the acts of Assembly in force relating to the Court of Chancery, and the Equity jurisdiction of the County Courts; and the laws of the last session of the legislature, with a separate index to each.

The above work may be seen at the Federal Gazette Office, where gentleman who wish to secure copies will please to call and leave their directions as early as convenient; there being but a small number printed besides those which belong to the state.—*Fed. Gazette.*

From the Boston Centinel, Oct. 25.

EXTRAORDINARY PRODUCT.

There have been raised and gathered this year from one acre of land the farm of the hon. Jonathan Hunnewell, of Newton, one hundred and eleven bushels and a half of Indian corn. We believe this has never been equalled in Massachusetts, if in New England. An account of the culture and quality of this maize, will, we learn, be communicated to the agricultural society for publication.

From the New York Evening Post.

Although the above yield is very great, yet it does not compare with the following:

Large yields of Indian Corn.—At the Otsego county cattle show and fair, held at Cooper's town, (N. Y.) on the 2d and 3d inst. the first premium for the best acre of Indian corn, 125 bushels and 4 quarts was awarded to David Taft, of Richfield: and the second, for the next best acre 120½ bushels, to Isaac Lightman, of Laurens.

The following is a very cheap, easy and SPEEDY *method for making the very first rate VINEGAR:*

Take any quantity you please of the *first* ripe apples that fall, and which are always worth the least for cider, which should either be ground very *coarse* in a mill, or what is equally good, bruised in a barrel with a common pounder. Then of the coarse ground or bruised apples, put a layer of about two inches deep into the bottom of a light clean cask; then a layer of clean straw of about the same thickness, and so on till the cask is full, observing to press the straw and apples well together with the hand while filling the cask.—Then take one fourth part as much water as the *same apples* would make of cider, (if ground and pressed,) and pour it a little at a time into the cask of apples and straw. Let it stand two or three hours, and then drain it off very slowly, just as you would water through ashes for making lie. And being thus drained off, the same liquor is then to be run through three or four times a day for two days successively. It is then to be put into a clean cask, where it may work standing in the sun. In a short time it will become very fine *sharp* Vinegar.

New London Advocate.

Mushrooms.—Doctor Darwin, in his *Phytologia*, informs us, that, of about *two hundred* species of this vegetable or vegeto-animal product, only *two* or *three* can be safely used as food, or as condiment. Every year we have, in our public journals, notices of the fatal effects of eating Mushrooms. We are informed that a respectable family in this city, very lately suffered severely from the use of this product which however palatable, is so frequently pernicious in its effects, that it ought to be universally shunned.

Receipt for Blacking.

In three pints of small beer, put two ounces of ivory black, and one penny worth of brown sugar. As soon as they boil, put a dessert spoonful of sweet oil, and then boil slowly until reduced to a quart. Stir it up with a stick every time it is used, and put it on the shoe with a Brush when wanted.

Another.—A quarter of a pound of ivory black, a quarter of a pound of moist sugar, a table spoonful of flour, a piece of tallow about the size of a walnut, and a small piece of gum arabic. Make a paste of the flour, and while hot, put in the tallow, then the sugar, and afterwards mix the whole well together in a quart of water, and you will have a beautiful shining blacking.

Chinese method of rendering Cloth Water proof.

To one ounce of White Wax melted, add one quart of Spirits of Turpentine, when thoroughly mixed and cold, dip the cloth in and hang it up to dry. By this cheap and easy method, Muslin, as well as the strongest cloths, will be rendered impenetrable to the hardest rains, without the pores being filled up, or any injury done when the cloth is coloured.

THE FARMER.

BALTIMORE, FRIDAY, NOVEMBER 10, 1820.

Present Prices of Country Produce in this Market.

Actual sales of WHEAT—WHITE, 80 to 85 cts.—RED, 73 to 77 cts—CORN, 35 to 37 cts—RYE, 42 cts—OATS, 25 to 28 cts—HAY, per ton $17 to $18—STRAW, per ton, $7 to $8—FLOUR, from the wagons, $4 12½—WHISKEY, from do. 34½ cts.—PORK, prime pcs. per cwt. $14 to $15 50—BEEF, do. $11 to $13—BUTTER, per lb. 31 cts—EGGS, per doz. 20 cts—VEAL per lb. 6 to 8 cts—LAMB, per quarter, 37½ to 50 cts—BEEF, per lb. prime pieces, 8 to 10 cts—HAMS, 12 to 14 cts—MIDDLINGS, 10 cts.—CHICKENS, per doz. $2 50—POTATOES, 37½ to 50 cts—LIVE CATTLE, $5 50 to $6—London WHITE LEAD, $4 25—American do. $3 75—Boiled OIL, $1 37½—FEATHERS, 50 to 62½ cts—TAR $2 25—TURPENTINE, soft, $2 25—SPIRITS, do. 35 cts.—PITCH, $2 25—LARD, 11 to 12 cts.—SHINGLES, best Deep Creek, $8 50—Do. Small, $4 75—FLOORING PLANK, 5-4 $27—COTTON, Upland, 17 to 19 cts.—Maryland TOBACCO, 4 hhds, seconds, from Calvert County, at $4 50 and $5 50—2 hhd. at $8 and $11.

BALTIMORE,

PUBLISHED EVERY FRIDAY,

BY JOHN S. SKINNER EDITOR.